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ABSTRACT

The study involving two learning disabled (LD) seventh graders was designed to develop and evaluate a self instructional booklet that teaches adolescents to change their behaviors with minimal intervention from other individuals. The first part of the study examined whether LD Ss could learn the principles of self monitoring, goal establishment, and self administration of reinforcement by reading a self instructional booklet. The second part of the study analyzed the effect of each unit of the booklet on the students' application of the principles to their own behaviors. Application of the self control procedures produced inconsistent results both within and across Ss. Tables with statistical data are included, as are copies of the student opinion test and behavior checklist. (Author/SB)

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TEACHING SELF-CONTROL PROCEDURES TO LEARNING DISABLED YOUTHS

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The cooperation of Tonganoxie USD #464, Dr. Stephen McClure, Superintendent of Schools; Mr. Marvin Pine, Principal, Tonganoxie Middle School; Mrs. Marilyn Daniels, resource room teacher; and the students, parents, and regular classroom teachers who participated in this study is gratefully acknowledged.

The University of Kansas Institute for Research in Learning Disabilities is supported by a contract (#300-77-0494) with the Bureau of Education for the Handicapped, Department of Health, Education, and Welfare, U. S. Office of Education, through Title VI-G of Public Law 91-230. The University of Kansas Institute, a joint research effort involving the Department of Special Education and the Bureau of Child Research, has specified the learning disabled adolescent and young adult as the target population. The major responsibility of the Institute is to develop effective means of identifying learning disabled populations at the secondary level and to construct interventions that will have an effect upon school performance and life adjustment. Many areas of research have been designed to study the problems of LD adolescents and young adults in both school and non-school settings (e.g., employment, juvenile justice, military, etc.)

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COOPERATING AGENCIES

Were it not for the cooperation of many agencies in the public and private sector, the research efforts of The University of Kansas Institute for Research in Learning Disabilities could not be conducted. The Institute has maintained an on-going dialogue with participating school districts and agencies to give focus to the research questions and issues that we address as an Institute. We see this dialogue as a means of reducing the gap between research and practice. This communication also allows us to design procedures that: (a) protect the LD adolescent or young adult, (b) disrupt the on-going program as little as possible, and (c) provide appropriate research data.

The majority of our research to this time has been conducted in public school settings in both Kansas and Missouri. School districts in Kansas which have or currently are participating in various studies include: Unified School District USD 384, Blue Valley; USD 500, Kansas City, Kansas; USD 469, Lansing; USD 497, Lawrence; USD 453, Leavenworth; USD 233, Olathe; USD 305, Salina; USD 450, Shawnee Heights; USD 512, Shawnee Mission; USD 464, Tonganoxie; USD 202, Turner; and USD 501, Topeka. Studies are also being conducted in several school districts in Missouri, including Center School District, Kansas City, Missouri; the New School for Human Education, Kansas City, Missouri; the Kansas City, Missouri School District; the Raytown, Missouri School District; and the School District of St. Joseph, St. Joseph, Missouri. Other participating districts include: Delta County, Colorado School District; Montrose County, Colorado School District; Elkhart Community Schools, Elkhart, Indiana; and Beaverton School District, Beaverton, Oregon. Many Child Service Demonstration Centers throughout the country have also contributed to our efforts.

Agencies currently participating in research in the juvenile justice system are the Overland Park, Kansas Youth Diversion Project, and the Douglas, Johnson, Leavenworth, and Sedgwick County, Kansas Juvenile Courts. Other agencies which have participated in out-of-school studies are: Penn House and Achievement Place of Lawrence, Kansas; Kansas State Industrial Reformatory, Hutchinson, Kansas; the U. S. Military; and Job Corps. Numerous employers in the public and private sector have also aided us with studies in employment.

While the agencies mentioned above allowed us to contact individuals and support our efforts, the cooperation of those individuals--LD adolescents and young adults; parents; professionals in education, the criminal justice system, the business community, and the military--have provided the valuable data for our research. This information will assist us in our research endeavors that have the potential of yielding greatest payoff for interventions with the LD adolescent and young adult.

Abstract

The purpose of this study was to develop and evaluate a self-instructional booklet that teaches adolescents to change their behaviors with minimal intervention from other individuals. The first part of the study examined whether learning disabled youths could learn the principles of self-monitoring, goal establishment and self-administration of reinforcement by reading a self-instructional booklet. The second part of the study analyzed the effect of each unit of the booklet on the students' application of the principles to their own behaviors in an academic setting. The subjects, to varying degrees, learned the principles of self-control and applied the principles to their own behaviors. The application of the self-control procedures produced inconsistent results both within and across subjects. A discussion of how these results may be partially attributable to changes occurring within the resource room is presented with implications for future research.

TEACHING SELF-CONTROL PROCEDURES TO LEARNING DISABLED YOUTHS

One of the major goals of education is for children to move from the learning environment where the teacher is manager to one where the child is a self-manager, capable of controlling his/her own learning and making decisions concerning the arrangement of the environment (Haring & Bateman, 1977). In order to facilitate achievement of this goal, students should be taught to use self-control skills (O'Leary & Dubey, 1979). Self-control may be broadly defined as the ability to control one's actions in the absence of immediate external constraints (Thoreson & Mahoney, 1974). When children have learned this skill, they should be able to select a goal and follow the goal to its completion without parent or teacher intervention.

One group that may be especially in need of learning self-control is the "learning disabled" (Stephens, 1977). According to the research done at The University of Kansas Institute for Research in Learning Disabilities, learning disabled youths spend less time than non-learning disabled youths attending to work and engaging in study behaviors (Schumaker, Sheldon-Wildgen, & Sherman, 1980). These children have problems with cognitive/academic skills (Warner, Alley, Schumaker, & Deshler, 1980); and their executive functioning skills (e.g., goal setting, problem-solving) are deficient (Hazel, Schumaker, & Sheldon-Wildgen, 1981; Tollefson, Tracy, Johnsen, Buenning, Farmer, & Barke, 1980). The ability to select target behaviors and apply self-control techniques may help the learning disabled adolescent solve some of these problems.

One method of teaching self-control is through a behavioral approach. This involves several different independent components that can be manipulated by the student with varying degrees of influence by the experimenter or teacher. Glynn and Thomas (1974) have proposed four components:

1. Self-assessment: Determining if a defined behavior has occurred

2. Self-recording: Collecting data on one's own behavior

3. Self-determination of reinforcers: Selecting consequences to be used contingently

4. Self-administration of consequences: Delivering consequences according to a pre-arranged contingency

Foster (1974) added a fifth component, goal determination, which is the establishment of an appropriate criterion of the target behavior. Each of these variables can be manipulated in a research setting, and the effect of that manipulation on the target behavior in the primary setting, in secondary settings, and on other behaviors can be evaluated. The degree of control that the experimenter maintains can also be systematically varied by changing the obtrusiveness of data collection by the experimenter, the prompts to the subject to use the self-control strategy, and the amount of feedback and reinforcement for using the strategy.

Many learning disabled children attend resource rooms to receive specialized assistance in specific problem areas (Weiderholt, Hammill, & Brown, 1978). Many resource teachers make use of behavioral methodology to increase acceptable social and academic behaviors of these children. This usually involves using extrinsic reinforcers to shape the appropriate behaviors; these reinforcers are usually externally administered by the teacher. Unfortunately, even when appropriate behavior is demonstrated in the resource room, the same behaviors are not always exhibited in the regular classroom (Walker, 1979). In other words, generalization of these behaviors to other settings frequently does not occur. It has been suggested by other researchers that the generalization of behavior change must be programmed rather than expected or lamented (Stokes & Baer, 1977). Teaching of self-control skills has been proposed as a method of programming for generalization (Thoreson & Mahoney, 1974).

If children could learn to manage their own behaviors by selecting goals of their own choosing (social or academic) and to monitor their own behavior in appropriate situations, providing their own reinforcement from what is naturally available in the environment, these skills also might be applied to a wide range of other behaviors (Lopatto & Williams, 1976; Thoreson & Mahoney, 1974). A child could manage behaviors that are often inaccessible to adult change agents (Parks, Fine, & Hopkins, 1976).

The resource room provides the following advantages for teaching self-control:

1. Children with a history of experiencing consistent external contingencies are more likely to adapt well to the use of self-administered consequences (O'Leary & Dubey, 1979).

2. The smaller teacher-pupil ratio would allow closer monitoring by the teacher of the student's graphs and provide more immediate feedback than would occur in the regular classroom setting.

3. The population attending the resource room most likely will have the same types of problems and, thus, may provide encouragement and ideas for implementing the program for one another.

4. The resource room teacher may have more specialized training including the use of behaviorally based programs and, thus, be better able to give guidance in initiating a successful program.

Although self-control procedures have been successfully used with children of different age levels from preschool (Holman & Baer, 1979; Reiber, Schimoeller, & LeBlanc, 1976) through adolescence (Kaufman & O'Leary, 1972), there is a paucity of literature that uses an experimental approach to teaching self-control strategies with children labeled as learning disabled. Several research projects currently in progress at The University of Kansas Institute for Research in Learning Disabilities concentrate on the use of self-regulation or self-control strategies with learning disabled adolescents. Seabaugh and Schumaker (1981) have had success with combining self-regulation skills (behavioral contracts, self-recording, self-evaluation, and self-reward) with a counseling approach to

obtain increases in academic behaviors. The attribution research by Tollefson and her colleagues (1980) is currently investigating how learning disabled adolescents can change the degree to which they see themselves as responsible for their academic performance by teaching them goal-setting skills.

Both of the above studies used instructional procedures which require considerable amounts of teacher instructional time. The purpose of the present research was to study a self-instructional approach to teaching self-control to learning disabled adolescents in the resource room and to evaluate the effects of the instruction on the students' academic behavior.

STUDY I: EVALUATION OF A SELF-INSTRUCTIONAL PACKAGE ON SELF-MANAGEMENT

The purpose of the first study was to develop and validate a self-instructional package (a book and testing materials) that would give learning-disabled youths information on three components of self-management: self-recording, goal-selection, and self-administration of reinforcers.

Methods

Subjects

Two 12-year-old seventh grade boys were selected from a resource room for learning disabled (LD) youths on the basis of: (a) willingness to participate, and (b) low rate of completion of assignments. The first student's IQ score (WISC) was 109, and he performed at the fifth grade level in reading, fourth grade level in arithmetic, and third grade level in spelling (WRAT). The second student's IQ score (WISC) was 88, and he was performing at the fifth grade level in reading, sixth grade level in math, and fourth grade level in spelling (WRAT). Both subjects were classified as learning disabled and had been in a special education class for three years. Formal consent was obtained from each student's parents and students themselves before beginning the study.

Setting

The study took place in a junior high school resource room serving learning disabled adolescents. Two adjoining study booths were set up in the back of the classroom where the students worked. A chair was placed beside each booth where an experimenter could sit.

Materials

A self-instructional package was developed and evaluated (see Footnote 1). The package, based on earlier work of Foster (1974), consisted of three chapters: Self-Monitoring, Goal-Selection, and Self-Administration of Reinforcers. Emphasis was placed on active written responses by the students throughout the instructional sequence. The package, which was 140 pages long, consisted of brief, simply written paragraphs of information on self-control strategies followed by exercises that required the student to apply the information to practical situations. Examples of correct answers immediately followed each exercise. The tests were a mixture of short answer, graphing, and true-false questions.

The subjects were expected to answer with a few words, complete graphs, or mark statements that were true according to the directions given at the beginning of a question.

Two junior high girls, aged 12 and 14, who were not receiving any special services from the school, pilot-tested the self-instructional package. Two of the experimenters went to the girls' home to do the pilot testing. The girls read the chapters and took the tests, and then gave feedback about the content (regarding unclear phrases and words they did not understand) and helped provide examples that would be interesting to teenagers. Revisions were then made based on this information.

Measurement Systems

The measurement system consisted of two components. First, three comprehensive tests were used to determine if the subjects acquired the information presented in the three sections of the instructional package. The subjects responded in writing to the test, thus providing permanent product data which were scored by observers. The percentages of questions answered correctly on each test were the primary data for this study.

Reliability of the grading of the tests was determined by having a second person grade randomly selected chapter tests. At least one chapter test was selected for each student. The grading was accomplished by xeroxing the students' tests and having the two graders score each answer as correct or incorrect. The two graders' sheets were compared question by question. An agreement was scored when both graders had determined an answer was correct or when both determined an answer was incorrect. The percentage of agreement was calculated by dividing the number of agreements by the total number of questions on the test. The total percentage of agreement was 97% with reliability on individual tests ranging from 96% to 100%.

A second type of data was gathered concerning the completion of assignments before, during, and after the study. These data were taken from the teacher's records. The teacher gave the students credit for one completed assignment while they worked with the experimenters, in addition to the completion of any assignments as written on their assignment sheets. Both experimenters independently counted the number of assignments completed as recorded by the teacher. An agreement was scored for each day the experimenters counted the same number of assignments completed. Reliability on assignment completion was 100%.

Finally, opinions of the students and the resource teacher regarding the training materials and procedures were solicited by means of the Student Opinion Sheet (Appendix A) and the Teacher Opinion Sheet (Appendix B).

Procedures

The youths were taught three self-management behaviors in three separate, sequential chapters: (a) self-recording, (b) establishing a goal that is reasonable (i.e., within the behavioral repertoire and above average performance for the student), and (c) determining when and what reinforcers should be delivered based upon the goals set. Both youths worked through the package (the book and the tests) for approximately 20-25 minutes per day, 3 days a week.

The experiment followed these steps for each subject:

1. Presentation of the entire set of three tests in written format; each test was designed to assess mastery of the instructional objectives for each chapter.

2. Presentation of Chapter I, Self-Monitoring. The students read the chapter. An experimenter answered questions and took notes on material that the students had difficulty understanding.

3. Presentation of the entire set of 3 tests, same format as before.

4. Presentation of Chapter II, Establishment of Goals, using the same procedures as Chapter I.

5. Presentation of the entire set of 3 tests, same format as before.

6. Presentation of Chapter III, Self-Administration of Reinforcers, using the same procedures as Chapter I.

7. Presentation of the entire set of 3 tests, same format as before.

Testing occurred before and after each section of the instructional package. A score of 70% (or above) correct was established as the criterion to be met before a student could proceed to the next chapter. Revisions in the self-instructional chapters, based on the feedback from both LD adolescents, were made after the subjects had completed the entire book.

Experimental Design

This study was an evaluation of a specific teaching procedure through a multiple baseline design across three sections of the self-management package similar to that used by Fawcett and Miller (1975). The subjects were asked a set of questions covering the content of all three sections before beginning each section and upon completion of the entire package. It was anticipated that increases in knowledge about each section would be demonstrated only after exposure to the information within that section.

The comparisons emphasized in this experiment were:

1. Do the learning disabled youths acquire self-management information? (Pre-test/Post-test compairson)

2. Is this information acquired as a result of the instructional package? (Multiple-baseline design)

If the instructional package was successful, clear differences would appear between the pre- and post-test for each of the three sections. If these increases were a result of the instructional package and not other variables (e.g., instruction from other teachers), increases in each section of the test would occur only after instruction had been presented on that section. This design allows one to determine not only whether subjects acquire new information during the implementation of a program, but also the relationship of each section of the program to that learning.

Results

The comparison of the students' pre-test and post-test scores (Figure 1) shows that learning did occur. Student 1 had an increase of 23 percentage points and lost only 1 percentage point by the final testing. Student 2 gained 25 percentage points and lost only 3 percentage points by the final testing.

Insert Figure 1 about here

Each chapter test was graded separately (Figure 2) and the results by

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Insert Figure 2 about here
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chapters are given in Table 1. On the Chapter 1 test, Student 1 gained 14

Insert Table 1 about here
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percentage points immediately after Chapter 1 instruction and gained an additional 2 percentage points by the final testing. Student 2 gained 22 percentage points immediately after Chapter 1 instruction, and gained an additional 4 percentage points by the final testing. For the test over Chapter 2, Student 1 increased 37 percentage points immediately after Chapter 2 instruction and lost 6 percentage points by the final testing. Student 2 had an 18 percentage point gain the first time he completed Chapter 2 and a 40 percentage point increase the second time with a loss of 16 percentage points by the final testing. He did not reach criterion on the first post-test and had to complete the chapter again. For the Chapter 3 test, Student 1 had a 22 percentage point increase immediately after Chapter 3 instruction (the posttesting was also the final testing). Student 2 had a 14 percentage point increase immediately after Chapter 3 instruction.

Figure 3 shows the percent of assignment completion for each subject. Before

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Insert Figure 3 about here
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receiving self-control instruction, Student 1 completed 92% of his daily assignments, and after intervention he completed an average of 96% of his assignmenets. Student 2's average assignment completion rates were: before training, 56%; during training, 69%; and after training, 97%.

STUDY II: APPLICATION OF A SELF-INSTRUCTIONAL PACKAGE ON SELF-MANAGEMENT

The purpose of the second study was twofold: (a) to continue the validation of the self-instructional package that would give learning disabled youths information on three components of self-management (self-recording, goal-selection, and self-administration of reinforcers), and (b) to apply the content of the package to academic behaviors that were currently in progress in the resource room.

Methodology

Subjects

Four junior high students from a resource room for LD youths volunteered to participate in the present study. Student 3 was a 15-year-old male in the eighth grade. His IQ score was 89 (WISC Full Scale), and standardized tests showed he was functioning at the fifth grade level in reading and math, and the fourth grade level in spelling. This was his fifth year in a special education class.

Student 4 was a 12-year-old male in the seventh grade who had scored 74 on an IQ test (Otis Lennon) and, according to results of standardized tests, was functioning on the following grade levels: reading, fourth grade; math, fourth grade; spelling, fourth grade. He had been in special education classes for the two preceding years.

Student 5 was a 13-year-old seventh grade male who had scored 105 on an IQ test (WISC) and was reading at the fourth grade level. He was functioning on the seventh grade level in math and the third grade level in spelling.

Student 6 was a 12-year-old male in the sixth grade who was functioning at the sixth grade level in reading and spelling, but at the fifth grade level in math. He had just been admitted to the resource room program. IQ information was not available for this study.

All four students had been classified by the school psychologist as learning disabled. Formal consent was obtained from each student's parents and each student before the study began.

Setting

The second study took place within the same resource room as Study I at a different time of the day. The room arrangement was the same.

Materials

The self-instructional package developed and evaluated in Study I was used in this study with revisions as needed. In addition, various kinds of data recording devices (e.g., graph paper, data sheets) were used.

Measurement Systems

Data were obtained in three different ways. First, the test scores from the self-control package were collected as in Study I. The reliability of the test grading was determined and calculated using the same methods as in Study I. The total percentage of agreement for Study II was 96% with agreement on individual tests ranging from 77% to 100%.

Second, data were collected by the experimenters from the teacher's records on assignments completed in the resource room. For example, the number of answers correct were divided by the number of answers possible for each assignment in several academic areas. These assignment scores were the ones the students would later choose to modify. (See detailed descriptions of the data collected for and by each student below.)

Third, consumer satisfaction data were collected from the students and the resource room teacher. Students were asked about the difficulty and value of the self-control text, and they were asked if they would use the self-control techniques in the future (Appendix A). The teacher was asked about the procedures of the study and its value to LD students and Ld teachers (Appendix B).

Procedures

Each student completed the tests for the three chapters (pre-test) and then read the first chapter of the book (as in Study I) for approximately 15-20 minutes per day, 3 days per week. When Chapter 1, Self-Recording, was completed, the student was tested on all three chapters. Then the student, conferring with one of the experimenters and the classroom teacher, chose one academic behaviors to change. A graph for recording the rate, percent correct, or frequency of that behavior was constructed by the student and checked by an experimenter. Any necessary revisions in the graph were then made by the student. For example, sometimes labels or units of measures were inappropriate and required revision. The student then began recording data for the chosen behavior on the graph each day. This constituted the self-recording condition.

After a few days of self-recording, the student began reading Chapter 2, Goal Setting. After completing this chapter, the student was again tested over all three chapters. Then a goal was established (with the assistance of the experimenter) and recorded on the graph as a horizontal dotted line after the baseline condition. The student also began graphing a second behavior, to be followed later by a third. Each baseline (self-recording condition) was followed by a goal-establishment condition, as time allowed.

The student reached the goal attainment with the first behavior for a few days, and then began reading Chapter 3 Rewards. When Chapter 3 was completed, the student was tested over all three chapters.

The behaviors chosen for modification differed across students, depending upon the academic behaviors targeted in the resource room, the interests of the student and the priorities of the teacher. Student 3 graphed the following behaviors:

1. Basic Skills in Math--percentage of correct answers achieved each day for multiplication or division problems

2. Vocabulary Skills Book--percentage of correct answers to questions based on a specific vocabulary level

3. Multiplication Timed Tests--total number of multiplication facts (7's) answered correctly in one minute

The behaviors graphed by Student 4 were:

1. Basic Skills in Math--percentage of correct answers achieved each day for multiplication or division problems

2. Reading Skill Book--percentage of correct answers to questions at a specific reading level

Subject 5 chose the following behaviors:

1. Vocabulary Words--A comprehensive list of words categorized into different levels was used. The student gave a definition of the word. When a word was defined correctly three consecutive times, it was counted as "mastered." The total number of words mastered for a week was graphed.

2. Comprehension--The student read one- or two-page selections and answered three comprehension questions on each selection. The percentage of correct answers was graphed.

3. Vocabulary Skills--percentage of correct answers to questions based on a specific vocabulary level

Subject 6 graphed the following:

1. Multiplication--the percentage of correct answers on five to ten problems completed each day was graphed

2. Division--four to ten problems were worked daily and graphed as percent correct

Reinforcement Systems

Each chapter in the self-control package was divided into sections approximately 20 pages in length. When a student completed a section, a tangible reinforcer (soda pop) was provided. When a student met criterion on a final chapter test, he was treated to lunch away from school premises with the experimenters.

Experimental Design

A multiple-baseline across behaviors with replication across individuals was the basic design used for this study. The specific behaviors for a given subject were selected on the basis of the responses occurring at a low enough rate to demonstrate improvement, the opportunity for their occurrence sufficiently high to demonstrate improvement, and ease of management by the subject. The emphasis was on obtaining measures of the subject's performance that were sensitive to change.

Under baseline conditions, the experimenter took data on three (or more) behaviors for each subject. The intervention consisted of the subject's selecting a behavior and then collecting data on his own performance, first on one behavior, then two, then three behaviors in a multiple-baseline design.

Results

Packet Testing

The overall pre-test to post-test comparisons (Figure 4) show that learning

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Insert Figure 4 about here

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did occur and persist. Student 3 had an overall increase of 36 percentage points on the entire test and gained an additional 4 percentage points on the final testing. Since the 70% criterion level was not met, Students 4 and 5 repeated Chapter 2. Student 4 gained 33 percentage points the first time and 49 percentage points the second time with a loss of 2 percentage points at the final testing. Student 5 gained 27 percentage points the first time and 53 the second with a loss of 8 percentage points at the final testing. Student 6 did not complete the packet due to time constraints and no overall comparison could be made. Therefore, the data shown in Figure 5 reflect improvement after he completed two of the three chapters. Tests for each chapter were scored separately (Figure 5) and the results by chapter are given in Table 2.

Insert Figure 5 and Table 2 about here

On the Chapter 1 test, Student 3 had a 30 percentage point increase and gained 12 more percentage points by the final testing. Student 4 had a 45 percentage point increase and gained 5 more percentage points by the final test. Student 5 had a 52 percentage point increase and gained 13 more percentage points by the final testing. Student 6 had a 40 percentage point increase; however, he did not complete Chapter 3. Thus, no final test scores were available.

For Chapter 2, Student 3 had a 51 percentage point increase and lost 1 percentage points by the final testing. Student 4 had a 17 percentage point increase the first time he completed Chapter 2, but a 64 percentage point increase the second time. He then lost 11 percentage points by the final testing. Student 5 had a 33 percentage point increase the first time and an 82 percentage point increase the second time with a loss of 49 percentage points by the final testing. Student 6 had a 6 percentage point increase and did not complete Chapter 3.

On the Chapter 3 test, Student 3 gained 23 percentage points. This was the post-test gain and also was considered the final testing because this was the last time the test was given. Student 4 had a gain of 34 percentage points and Subject 6 had a gain of 11 percentage points.

Application of Self-Control Package

The means of the behaviors during the different treatment conditions are given for each student in Table 3. Figure 6 shows the percent of weekly assignment completion for each subject. While completing the self-control package, Student 3 completed 48% of his assignments per week. His percentage of assignments increased to 62% during the last six weeks as he neared completion of the packet. Student 4 completed 80% of his assignments per week. Student 5 completed 83% of his assignments per week, and Student 6 completed 86% of his assignments per week.

Insert Table 3 about here

Insert Figure 6 about here

The graphs of the students' academic behaviors are presented in Figures 7, 8, 9, and 10. These data are based on scores from the teacher's records.

Insert Figures 7, 8, 9, & 10 about here

Student 3 showed an increase in two of three behaviors when he moved from baseline to self-recording, although one increase was quite small. The third behavior, vocabulary skills, decreased at that time. When goal-setting was introduced in math and vocabulary skills, both of these behaviors decreased. However, as can be seen from Figure 7, there was a great deal of variability.

For Student 4, math decreased slightly and reading increased slightly from baseline to the self-recording condition. The scores of both behaviors then increased during the goal-setting condition.

Two behaviors increased slightly from baseline to the self-recording condition for Student 5. There were no baseline scores for the third behavior, vocabulary skills, because instruction in this subject was started toward the end of the semester, and the subject started graphing when the instruction began. When the goal-setting condition was introduced, one behavior decreased while two behaviors increased.

Subject 6 showed increases in both behaviors when he moved from baseline to the self-recording condition.

Subjective Measures

The results of the student evaluation of the book, Self-Control for Teenagers, as measured by the Student Opinion Sheet (Appendix A), are as follows. Of the six students from both studies, five found the book "A little interesting" and one found it "very interesting." All six students found the book "okay" which was the middle score between "very hard" and "very easy." Three students thought the book taught them "a lot" while the other three marked "a little." Four students liked the book "a lot", and two thought it was "okay." Three students said "yes" they would use these self-control methods in the future, two said "sometimes" and one said "maybe."

The results of the Teacher Opinion Sheet (Appendix B), given at the completion of each study, are in Table 4. The LD resource teacher felt that other teachers of learning disabled students would find the book useful. She felt that students had benefitted from the project and were likely to use self-control procedures in the future. The resource room teacher and teachers from other classes were asked to rate the students on the student's behavior in the classroom before the experiment and at its end. Three of the students were involved in this inquiry. The data for the pre- and post-inquiry comparison are shown in Tables 4 and 5. Of the 32 behaviors where changes were noted, teachers rated changes in 27 behaviors as positive changes.

Insert Tables 4 and 5 about here

DISCUSSION

Packet Testing

In both Study I and Study II, results indicated that learning did take place and was maintained (Figures 1 & 4). A closer look at the individual chapters shows which chapters did in fact teach the students the procedures.

In both studies there is a clear-cut difference in the pre-test and post-test scores (Figures 1 & 5) for Chapter 1 with a greater difference showing up in Study II due to the low pre-test scores. Chapter 1 did teach the students how to select a behavior to change and how to graph that behavior in the structured situations arranged by the test.

In Study I (Figure 2), there was a change from pre-test to post-test scores on the Chapter 2 test, and even though two students had to complete the chapter again, learning did occur, although to a lesser degree than in Chapter 1. However, if one looks at Study II (the Chapter 2 part of Figure 5), the amount of learning that took place is questionable. Only one student (Student 3) of the three who completed the entire packet, did not have to complete Chapter 2 a second time. One student with a low score for Chapter 2 (6) would have completed it again if time had permitted. There was also loss of information by the time of the final post test for all students. Therefore, Chapter 2 was not effective in teaching material on a one-time basis.

There are several possible explanations for this lack of learning. First, Chapter 2 included procedures for completing a mean by summing baseline scores and dividing by the number of days. One reading of the chapter may not have provided sufficient exposure to this concept. Also, the division to be completed was difficult and required some time for these students to complete. Several students had not been introduced to division with decimals. There was much room for error in the math alone on the chapter test. Another contributing factor could be that the test for Chapter 2 contained a large proportion of questions to which the student had to give a reason or an example, or otherwise discuss an item. The test over Chapter 1 consisted only of questions where the correct response was given to the student (e.g., multiple-choice format) or straight forward graphing problems. It could be that the students could discriminate correct responses, but had great difficulty in constructing a response in their own words. These reasons may account for the fact that two of the three students could describe how to set goals according to methods described in the programmed book, even though their test scores for this chapter were low. Also, when one considers the pre-test scores of those students who completed the package, it is evident that learning did indeed occur.

The students in Study I appear to have learned the material in Chapter 3. However, in Study II, only one of the three students who completed the chapter met the criteria for mastery. The other two students (4 and 5) would have completed the chapter again had time permitted.

Two strong possible causes exist for the lack of learning of two subjects in Chapter 3. Again, like Chapter 2, the test for Chapter 3 included many questions that required some kind of discussion of the part of the student. Another reason is more subjective; nonetheless, it must be taken into account. The two students who did not do well on the post-test (student 4 and 5) com-

pleted the test on the last day of school. Student 6 completed the Chapter 3 test about the same time; even though it was not a post-test, he scored much lower than he had scored on the two previous pre-tests. No experimenter was present when the last test was given. If the presence of the experimenter acted as a discriminative stimulus, this may have accounted for some difference. Also, there were several other last day activities scheduled, and the pupils may have completed the tests quickly in order to participate in these activities. The end of school likely did affect the performance of the students. However, conclusions concerning the efficacy of Chapter 3, like Chapter 2, have to be cautious.

The amount of time taken by the students can be obtained by the length of intervention from Figures 3 and 6. Student 3 completed the book more quickly than the other students; he required approximately 8 hours of instructional time (15-20 minutes per day, 3 days per week or 8 weeks). This time does not include the student's application of the procedures after reading the book. The students who applied the techniques as they read the book worked the entire semester (18 weeks) for a total of approximately 13½ to 18 hours of instruction.

Application of Self-Control Procedures in Academic Behaviors

For Student 3, the decrease in the mean math score from self-recording to goal-setting is greatly influenced by the initial low score of 50% in the goal-setting condition (Figure 7). This score may have resulted from a change in the type of problems worked--from multiplication to fractions. The paucity of data points during this condition may have been because the student was having difficulty completing all his assignments. For Vocabulary Skills, although the mean score during goal-setting decreased, an examination of the last five data points reveals that four of these were above the goal of 90% correct. More data points would be needed to tell if this trend would continue.

For Student 4, additional data points would be necessary to determine if goal-setting conditions were indeed different from the two previous conditions for both math and reading behaviors. In math, the mean number of multiplication problems correct and the range do not differ from baseline.

For Student 5, the decrease in the goal-setting mean score in vocabulary word scores may be attributed to the fact that this area was not emphasized by the classroom teacher during the last six weeks of the school year. Much of the allotted time was taken up by review tests on vocabulary words already learned. For vocabulary skills, although the mean of 91% correct during self-recording may indicate that treatment may not have been necessary, the data points are on a downward trend. The goal-setting phase shows an immediate increase in percentage correct that was maintained.

Student 6 started the program later than the other three students and only participated in the self-recording condition. Time did not allow implementation of the goal-setting condition.

The only procedure used by all four students was self-recording. It is not evident that self-recording alone produced meaningful changes in behavior, because experimental control was not established through the multiple-baseline across behaviors design. The results in the present study were too variable to conclude that the self-control procedures affected student behaviors.

There are several extraneous variables that could have contributed to the variability in the results. First, administrative problems interfered. Because of the time involved in field-testing the package (recording of student questions and problems in the package), the experimenters did not supervise the subjects' graphing on a daily basis. Thus, graphing done by the students was fairly independent of both the experimenters and the teacher. It would be desirable to have students graphing independently after the experimenters were sure that they could graph reliably and consistently.

Another administrative problem was that there were many conflicting activities occurring during the last month of school, such as standardized testing, parent conferences, graduation, etc. As a result, the students spent their time working on the package and being tested, and did not have much time to work on their regularly assigned academic subjects. Thus, there was less academic work completed and consequently fewer data points to record.

There were some problems connected with the content of the package. Two students did not learn how to set goals according to the methods in the package and completed Chapter 2 twice. Another student was extremely careful and proceeded at a rather slow pace through the package during the entire time of the study.

The fourth student entered the classroom late and, consequently, was a chapter behind. He did not have time to read Chapter 3 and, thus, to complete the program. Therefore, progress through the package was much slower than anticipated, even though he worked through the last day of school. None of the students had time to implement the procedures in Chapter 3, Self-Reward.

Another variable to consider was the method that several students used in recording their data. For the self-recording phase, because the number of possible opportunities for some behaviors differed each day, the students marked a circle for the number possible and an X for the number correct on their graph. This method corresponded to the teacher's recording system. However, when goals were set, this method of recording was not feasible. All data points were converted to percentage points at that time. It is possible that if percentages had been recorded originally, the behaviors might have been effected differently.

In addition, a number of academic programs changed during the semester. Of 13 initial programs, eight of these were discontinued. The teacher originally had been told to operate her classroom instruction as close as possible to the way she usually did, trying to best meet the needs of the students. At the beginning of this study, she said she expected the program to continue. Some of the initial programs were completed, and some were merely changed. This meant that the definitions of the behaviors being recorded were modified. The difficulty level of the tasks being monitored also may have changed.

Also, some tasks may have been devised so they became increasingly more difficult for the student. For example, with the vocabulary and spelling cards for Student 6, the student eliminated words as they were learned and maintained words that were not learned. It is possible that the words kept by the student were more difficult and made the task progressively harder.

There was a discrepancy between the students' and the teacher's data on some of the graphs. On some graphs, the students had more (or different) points than the teacher had. Reliability checks between the teachers' data and the experimenters' data were made eight times. The teacher was accurate but had omitted some data points.

Subjective Data

The final area analyzed is the subjective data collected while the experiment was being conducted. There were two kinds of data sought. The first was consumer satisfaction. The consumer was seen as being not only the student who used the techniques but also the teacher who hopefully would select the self-control package as part of the curriculum and also allow research in her class again. In general, the students seemed to like the book and said they might use the self-control methods in the future. The teacher also seemed pleased with the study.

The second type of subjective data collected was on the teachers' (resource and regular) perception of change in the students' classroom behaviors after the study. According to the data, the intervention had no effect on general school behaviors. For each student, more behaviors improved than worsened; thus, the teachers saw more positive than negative changes during the course of the study.

Implications for Future Research

Future research in this area should include independent reliability checks on both the students' and the teacher's data on a daily basis. More detailed information on accuracy of both the students and the teacher would be useful to determine more reliably whether differences in behavior occur after implementation of the self-control program..

More time is necessary than the January through May period during which this study was conducted. If the study began in September, necessary data for each condition could be collected, and the self-control procedures could be used in other classrooms. Shortening the textbook would also reduce the amount of time required for an individual to complete the package.

Presentation of the textbook on a daily basis (rather than three days per week) until the students have completed the program potentially would affect the acquisition of the information. In this way, the routine would not be changed from one day to the next, and the experimenters could gradually withdraw from the classroom after completion of the package to determine whether behavior changes are maintained without experimenter influence.

In order to circumvent the problems connected with allowing teacher freedom to change academic programs (and perhaps level of difficulty of the tasks), the experimenter may want to arrange with the teacher to use sequenced programs of academic materials. The experimenter should check to be sure the students are working on materials in which it is possible to experience success and that there are enough materials for the student for an entire year. In this way comparisons in data will be more valid, and it will be easier to evaluate behavior change.

Conclusions

Of the ten behaviors recorded in the present study, seven of these increased from the baseline condition to the self-recording condition. Of the seven behaviors targeted in the goal-setting condition, four of these showed an increase in the goal-setting condition over self-recording scores. However, these increases in target behaviors under self-recording and goal-setting conditions were sporadic and highly variable. Experimental control of these independent variables was clearly not established for any of the subjects. Conditions that may have affected these results adversely are: (a) inconsistent academic materials; (b) other classroom responsibilities and priorities, such as testing at the end of the semester; (c) the length of time to complete the book; and (d) difficulties with some of the recording procedures. It is recommended that this study be replicated in such a way that the experimenter have more control over the tasks given, the style of recording, and the emphasis on competing behaviors. There was enough change in some behaviors for some subjects to suggest that further research is warranted. In addition, the positive attitudes of both the subjects and the teachers indicate that they viewed the program as potentially useful.

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FIGURE 1

PRE/POST-TEST COMPARISON
OF CHAPTER TESTS
GROUP ONE

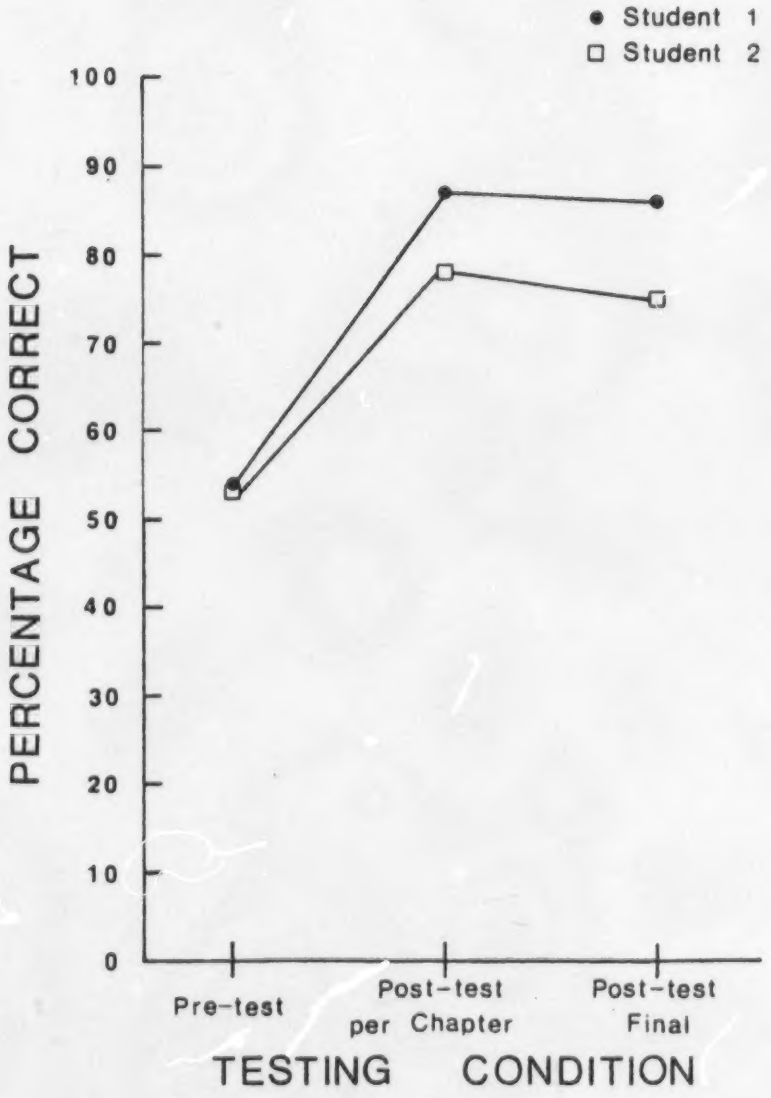

FIGURE 2

PERCENT SCORES FOR THE CHAPTER TESTS GROUP ONE

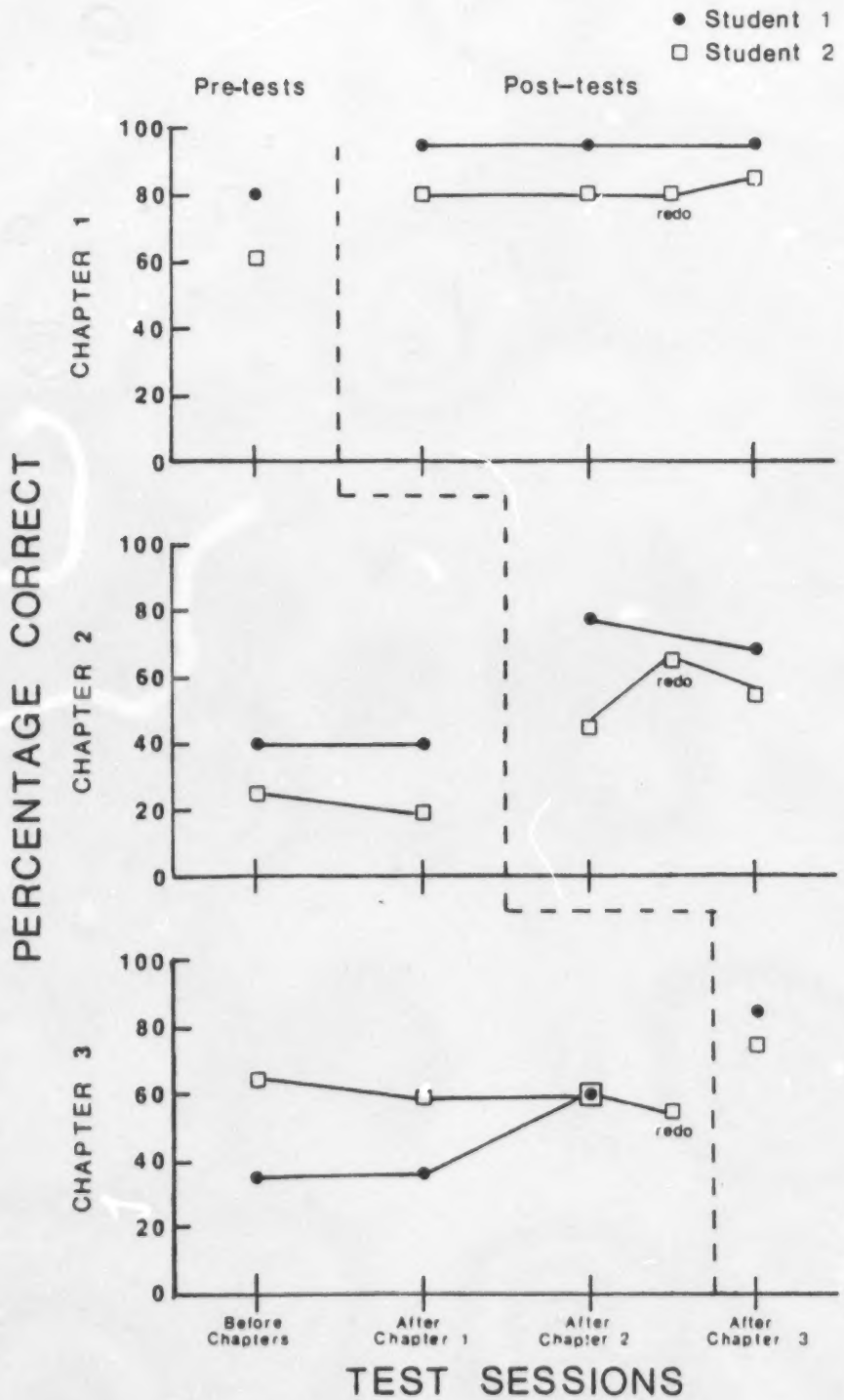

Table 1

Pre-test and Post-test Chapter Scores

Student	First Testing (Before Ch. 1)	Second Testing (After Ch. 1)	Third Testing (After Ch. 2)	Fourth Testing (After Ch. 3)
		Chapter 1		
1	83	97	98	99
2	63	85	85	89
		Chapter 2		
1	40	40	77	71
2	27	19	1st Attempt 45	51
			2nd Attempt 67	
		Chapter 3		
1	63	61	60	85
2	63	59	59	77
			54	

FIGURE 3

PERCENT COMPLETION OF WEEKLY ASSIGNMENTS

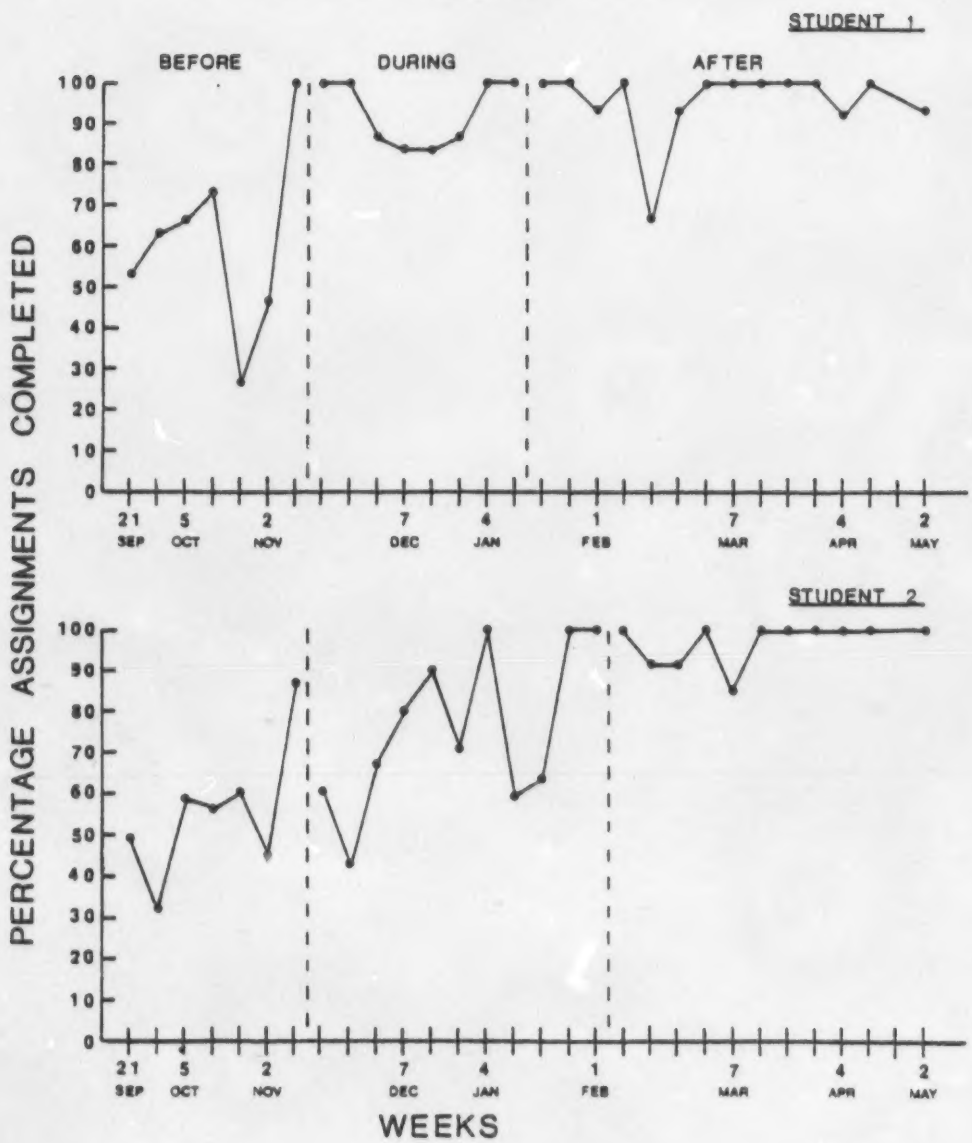

FIGURE 4

PRE/POST-TEST COMPARISON
OF CHAPTER TESTS
GROUP TWO

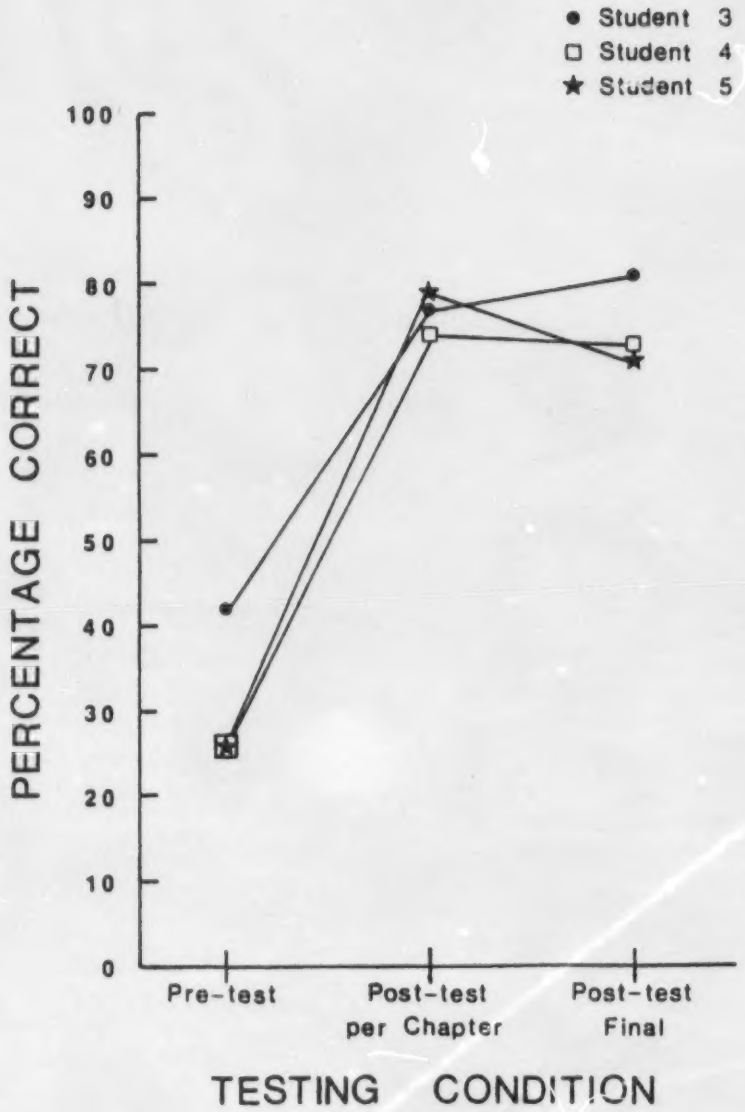

FIGURE 5

PERCENT SCORES FOR THE CHAPTER TESTS GROUP TWO

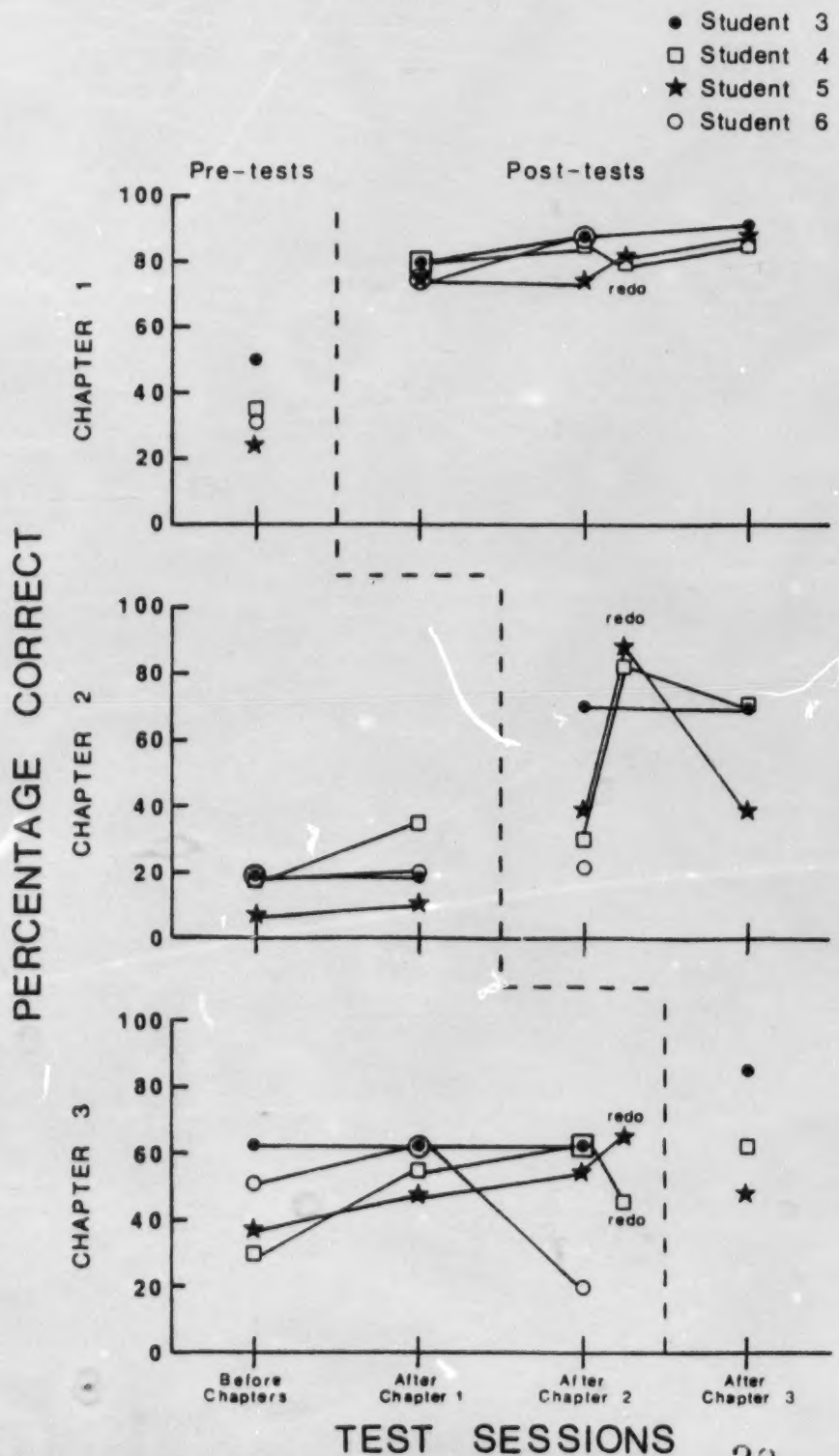

Table 2

Pre-test and Post-test Chapter Scores

Subject	First Testing (Before Ch.1)	Second Testing (After Ch. 1)	Third Testing (After Ch. 2)	Fourth Testing (After Ch. 3)
		Chapter 1		
3	50	80	87	92
4	35	80	84 79	85
5	24	76	74 81	89
6	36	76	87	--
		Chapter 2		
3	19	18	70	69
4	18	35	30 82	71
5	7	12	40 89	40
6	19	21	22	--
		Chapter 3		
3	63	63	63	86
4	29	54	63 46	63
5	37	47	55 66	48
6	52	62	19	--

Table 3

Mean Scores for Each Academic Subject

Student Number	Academic Subject	Baseline Mean Score	Self-Recording Mean Score	Goal-Setting Mean Score
3	Math	78	86	81.5
3	Vocabulary	91	87	83
3	Multiplication	38.7	39.4	---
4	Math	86	84	97
4	Reading	71	74	80
5	Vocabulary	9	13	5.2
5	Reading	72	73	83
5	Vocabulary Skills	--	91	100
6	Multiplication	71	85	--
6	Division	87	95	--

FIGURE 6

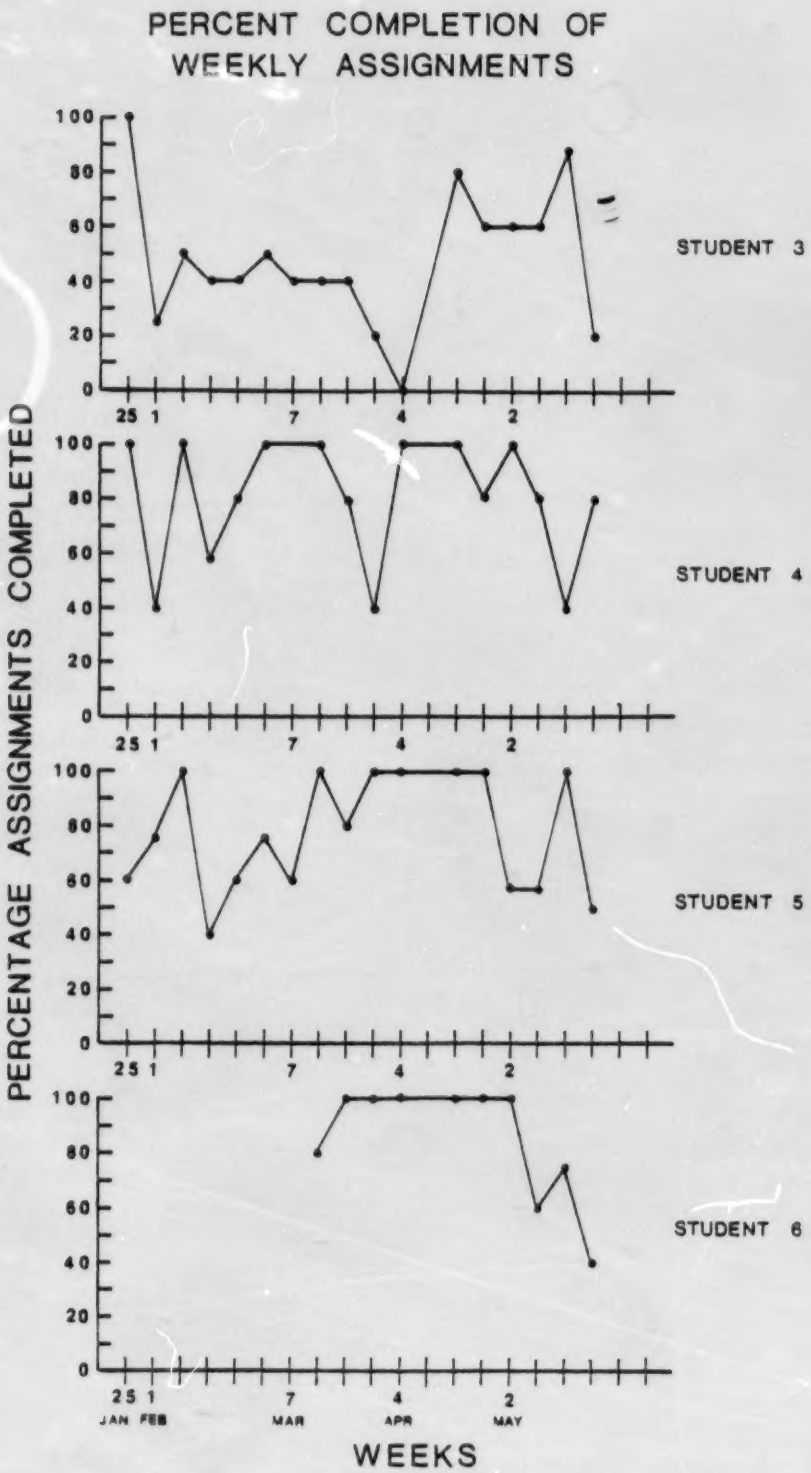
PERCENT COMPLETION OF
WEEKLY ASSIGNMENTS
PERCENTAGE ASSIGNMENTS COMPLETED
100
80
60
40
20
0
25 1 7 4 2
STUDENT 3
STUDENT 4
STUDENT 5
STUDENT 6
JAN FEB MAR APR MAY
WEEKS

FIGURE 7

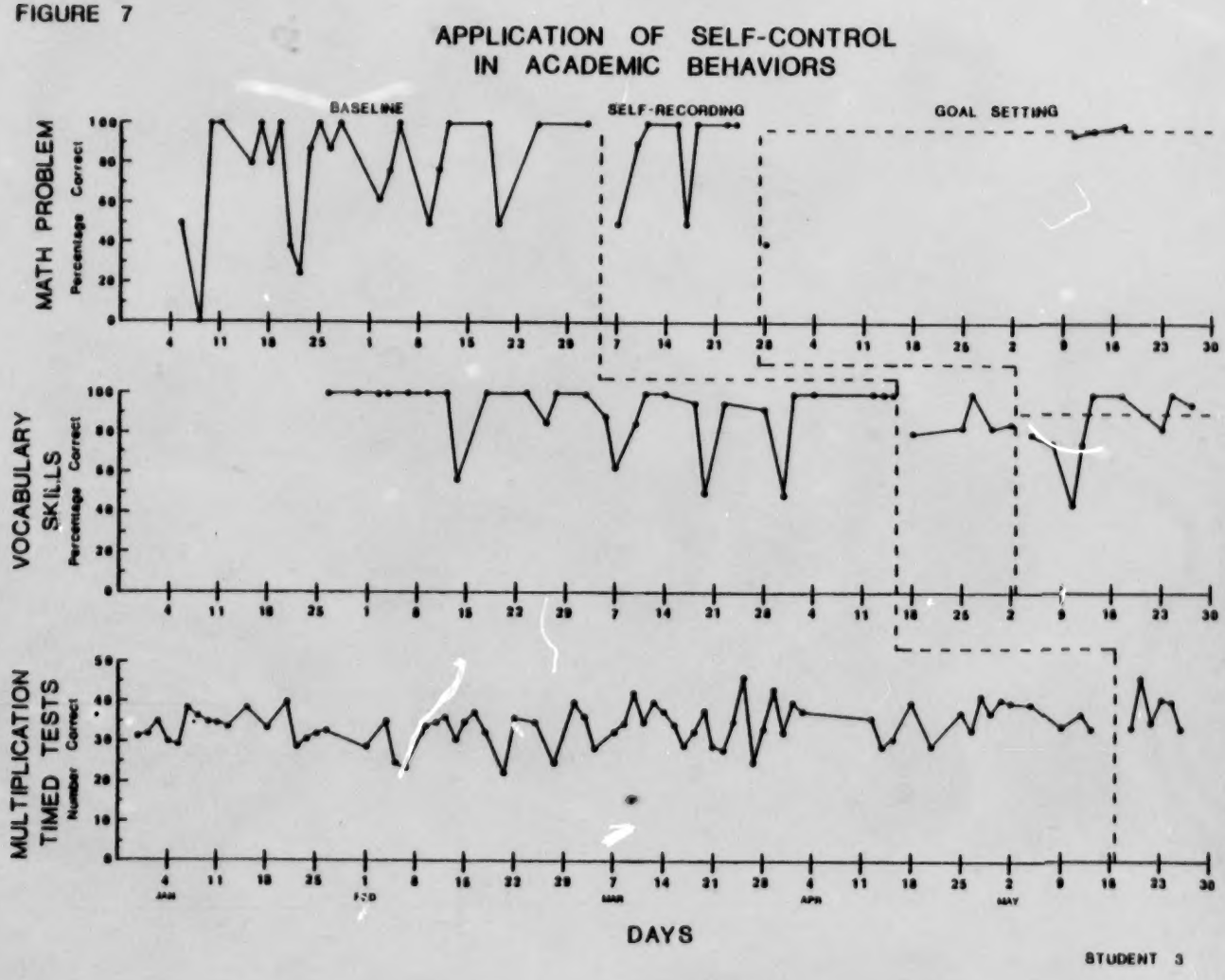
APPLICATION OF SELF-CONTROL
IN ACADEMIC BEHAVIORS
BASELINE
SELF-RECORDING
GOAL SETTING
MATH PROBLEM
Percentage Correct
VOCABULARY SKILLS
Percentage Correct
MULTIPLICATION TIMED TESTS
Number Correct
DAYS
STUDENT 3

FIGURE 8

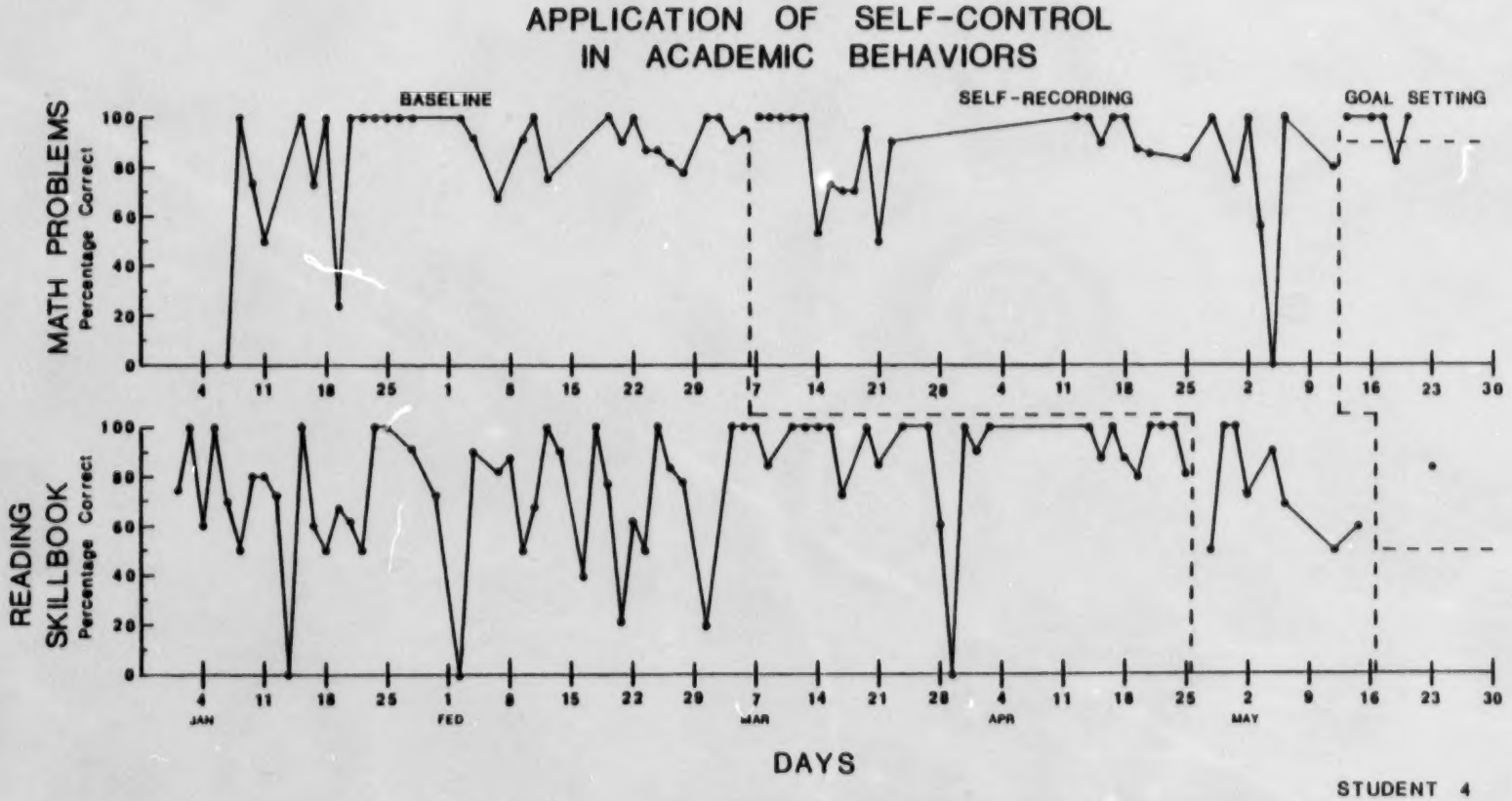
APPLICATION OF SELF-CONTROL
IN ACADEMIC BEHAVIORS
BASELINE
SELF-RECORDING
GOAL SETTING
MATH PROBLEMS
Percentage Correct
READING
SKILLBOOK
Percentage Correct
100
80
60
40
20
0
4
11
18
25
1
8
15
22
29
7
14
21
28
4
11
18
25
2
9
16
23
30
JAN
FEB
MAR
APR
MAY
DAYS
STUDENT 4

FIGURE 9

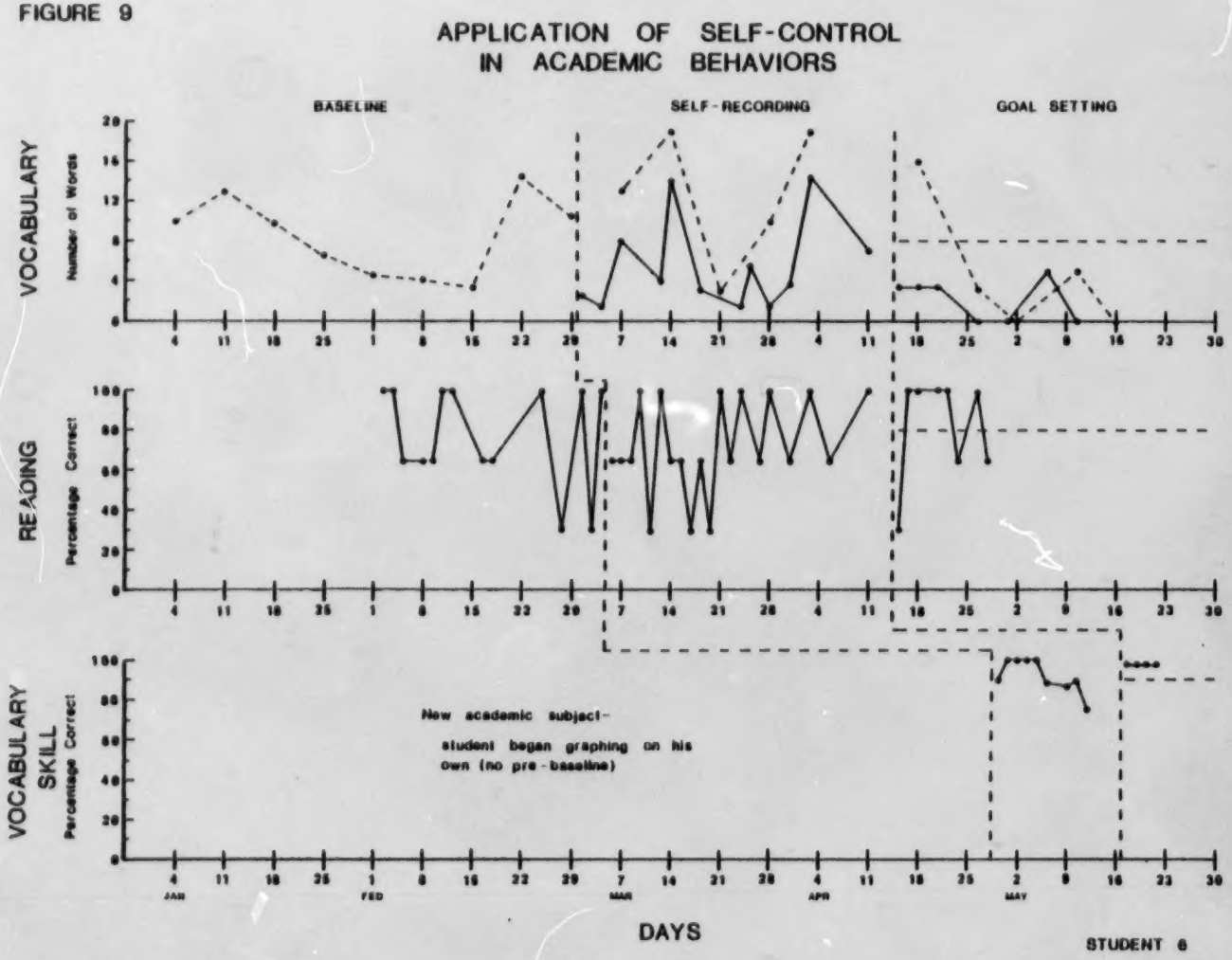
APPLICATION OF SELF-CONTROL
IN ACADEMIC BEHAVIORS
BASELINE
SELF-RECORDING
GOAL SETTING
VOCABULARY
Number of Words
READING
Percentage Correct
VOCABULARY SKILL
Percentage Correct
New academic subject-
student began graphing on his
own (no pre-baseline)
JAN
FEB
MAR
APR
MAY
DAYS
STUDENT 6

FIGURE 10

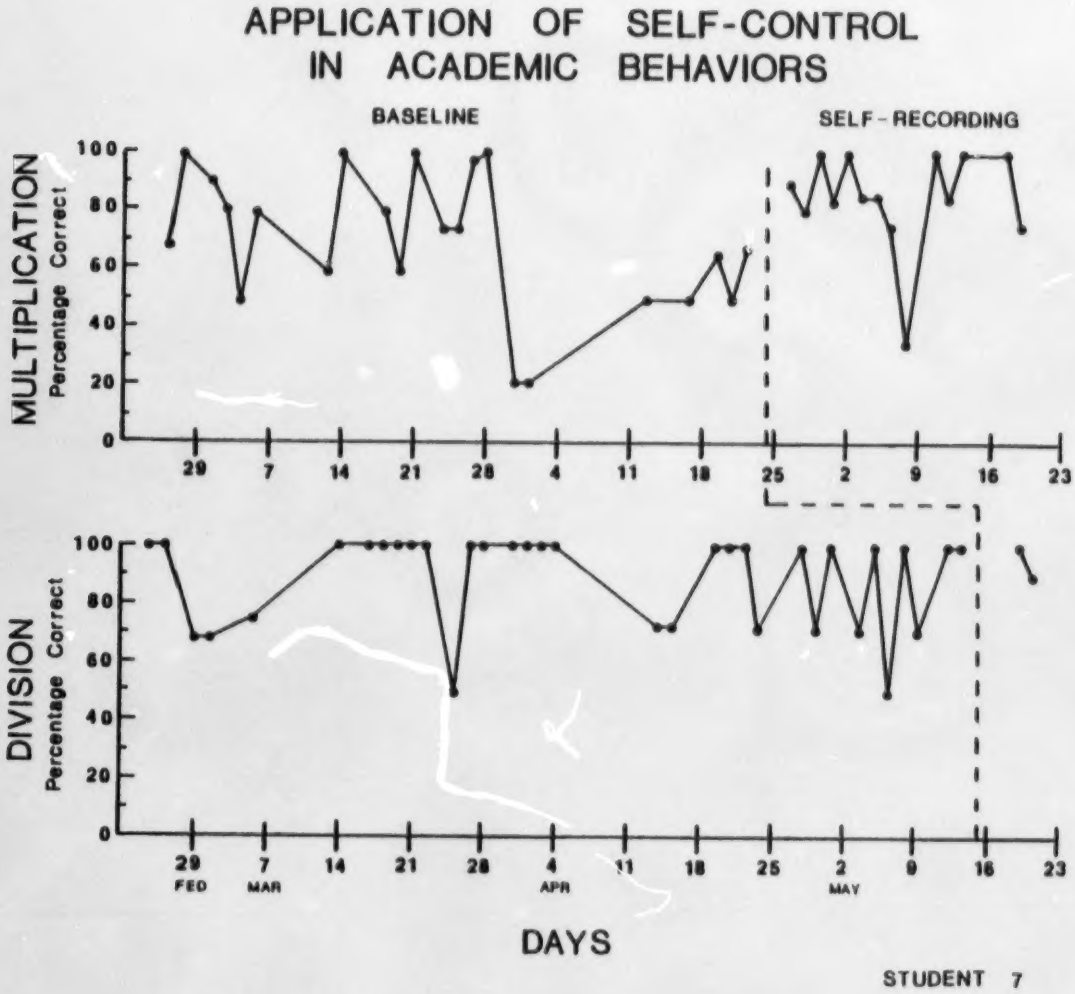
APPLICATION OF SELF-CONTROL
IN ACADEMIC BEHAVIORS
BASELINE
SELF-RECORDING
MULTIPLICATION
Percentage Correct
100
80
60
40
20
0
29
7
14
21
28
4
11
18
25
2
9
16
23
DIVISION
Percentage Correct
FEB
MAR
APR
MAY
DAYS
STUDENT 7

Table 4

Results of Teacher Opinion Sheet (Resource Room Teacher)

Question	Answer Study 1	Study 2
Took too many days to complete	agree	agree
Took too much student time	disagree	disagree
Students enjoyed the rewards	strongly agree	strongly agree
Researchers were distracting	strongly disagree	strongly disagree
Researchers sought teacher input about student goals	agree	agree
Researchers were open to suggestions from teacher about student needs	strongly agree	strongly agree
Researchers complicated normal running of classroom	agree	disagree
Students enjoyed working with researchers	agree	agree
Students are likely to use self-control procedures in future	agree	undecided
Teachers of learning disabled students would find this book useful	agree	agree
Students benefitted from the project	agree	agree

Table 5

Number of Teachers Showing Changes in Ratings of Student Behaviors Before and After Implementation of the Self-Management Package

Behavior	Subject 3			Subject 4			Subject 5		
	Pos. Change	Neg. Change	No Change	Pos. Change	Neg. Change	No Change	Pos. Change	Neg. Change	N Cha
Does assigned work in class	2	-	1	1	-	1	-	-	
Completes assigned work	-	-	3	2	-	-	1	-	
Does accurate work	-	-	3	2	-	-	-	-	
Does neat work	1	-	2	-	-	2	-	-	
Does extra work	1	-	2	1	-	1	1	-	
Complains about assignments	1	1	1	2	-	-	-	-	
Seeks out new assignments	-	-	3	1	-	1	1	-	
Positive attitude about this class	1	-	2	-	-	2	1	-	
Easily distracted	3	-	-	2	-	-	2	-	
Disturbs others	-	-	3	-	2	-	1	-	
Respectful to adults	-	-	3	-	-	2	-	1	
Tardy	-	-	3	-	-	2	-	-	
Keeps hands to self	-	-	3	1	-	1	-	-	
Makes noises	2	-	1	-	-	2	-	-	
Stays in seat	1	-	2	-	-	2	1	-	
Dawdles	-	-	3	1	-	1	-	-	
Asks for help	1	1	1	-	1	1	-	-	
Argues w/teacher	1	-	2	-	-	2	1	-	
Argues w/students	2	-	1	-	-	2	1	-	
Totals	16	2	39	13	3	22	10	1	2

APPENDICES

APPENDIX A

STUDENT OPINION

Student Number _____ Date _____

On numbers 1-4, please circle the best answer.

1. The book Self-Control for Teenagers was

Very Interesting A Little Interesting Okay A Little Boring Very Boring

2. The book was

Very Hard Hard Okay Easy Very Easy

3. The book taught me

A lot A little Nothing

4. How much did you like the book?

A lot A little Okay Didn't like Hated

5. Do you think you will use these self-control methods in the future?

APPENDIX B

TEACHER OPINION

Please circle the most appropriate answer.

1. The project took too many days in the classroom to complete.

   Strongly agree agree undecided disagree strongly disagree

2. The project took too much of students' time each day.

   strongly agree agree undecided disagree strongly disagree

3. The students enjoyed the rewards connected with the project.

   strongly agree agree undecided disagree strongly disagree

4. The researchers were distracting to students who were working.

   strongly agree agree undecided disagree strongly disagree

5. The researchers sought teacher input about appropriate goals for students' self-control programs.

   strongly agree agree undecided disagree strongly disagree

6. The researchers were open to suggestions from teacher (about the individual needs of the students).

   strongly agree agree undecided disagree strongly disagree

7. The researchers complicated the normal running of the classroom.

   strongly agree agree undecided disagree strongly disagree

8. The students seemed to enjoy working with the researchers.

   strongly agree agree undecided disagree strongly disagree

9. The students are likely to use the self-control procedures in the future.

   strongly agree agree undecided disagree strongly disagree

10. LD teachers would be likely to use a book on self-control like this.

    strongly agree agree undecided disagree strongly disagree

11. The students benefited from the project.

    strongly agree agree undecided disagree strongly disagree

Student Number _____ Class _____ Time _____

APPENDIX C

STUDENT BEHAVIOR CHECKLIST

PLEASE CIRCLE THE MOST APPROPRIATE RESPONSE FOR EACH OF THE FOLLOWING STUDENT BEHAVIORS

1)	DOES ASSIGNED WORK IN CLASS	Always	Usually	Sometimes	Hardly Ever	Never
2)	COMPLETES ASSIGNED WORK	Always	Usually	Sometimes	Hardly Ever	Never
3)	DOES ACCURATE WORK	Always	Usually	Sometimes	Hardly Ever	Never
4)	DOES NEAT WORK	Always	Usually	Sometimes	Hardly Ever	Never
5)	DOES EXTRA WORK	Always	Usually	Sometimes	Hardly Ever	Never
6)	COMPLAINS ABOUT ASSIGNMENTS	Always	Usually	Sometimes	Hardly Ever	Never
7)	SEEKS OUT NEXT ASSIGNMENT WHEN DONE WITH PRESENT ONE	Always	Usually	Sometimes	Hardly Ever	Never
8)	HAS POSITIVE ATTITUDE ABOUT BEING IN THIS CLASS	Always	Usually	Sometimes	Hardly Ever	Never
9)	IS EASILY DISTRACTED	Always	Usually	Sometimes	Hardly Ever	Never
10)	DISTURBS OTHERS IN CLASS	Always	Usually	Sometimes	Hardly Ever	Never
11)	IS RESPECTFUL TO ADULTS	Always	Usually	Sometimes	Hardly Ever	Never
12)	IS TARDY	Always	Usually	Sometimes	Hardly Ever	Never
13)	KEEPS HANDS TO SELF	Always	Usually	Sometimes	Hardly Ever	Never
14)	MAKES DISTURBING NOISES	Always	Usually	Sometimes	Hardly Ever	Never
15)	STAYS IN SEAT	Always	Usually	Sometimes	Hardly Ever	Never
16)	DAWDLES (WASTES TIME, STARES)	Always	Usually	Sometimes	Hardly Ever	Never
17)	RAISES HAND TO ASK QUESTIONS OR ASK FOR HELP	Always	Usually	Sometimes	Hardly Ever	Never
18)	ARGUES WITH TEACHER	Always	Usually	Sometimes	Hardly Ever	Never
19)	ARGUES WITH OTHER STUDENTS	Always	Usually	Sometimes	Hardly Ever	Never

20) PLEASE LIST ANY PROBLEMS THIS CHILD HAS WHICH ARE NOT LISTED ABOVE.

21) PLEASE LIST GOOD POINTS ABOUT THIS CHILD WHICH ARE NOT LISTED ABOVE.